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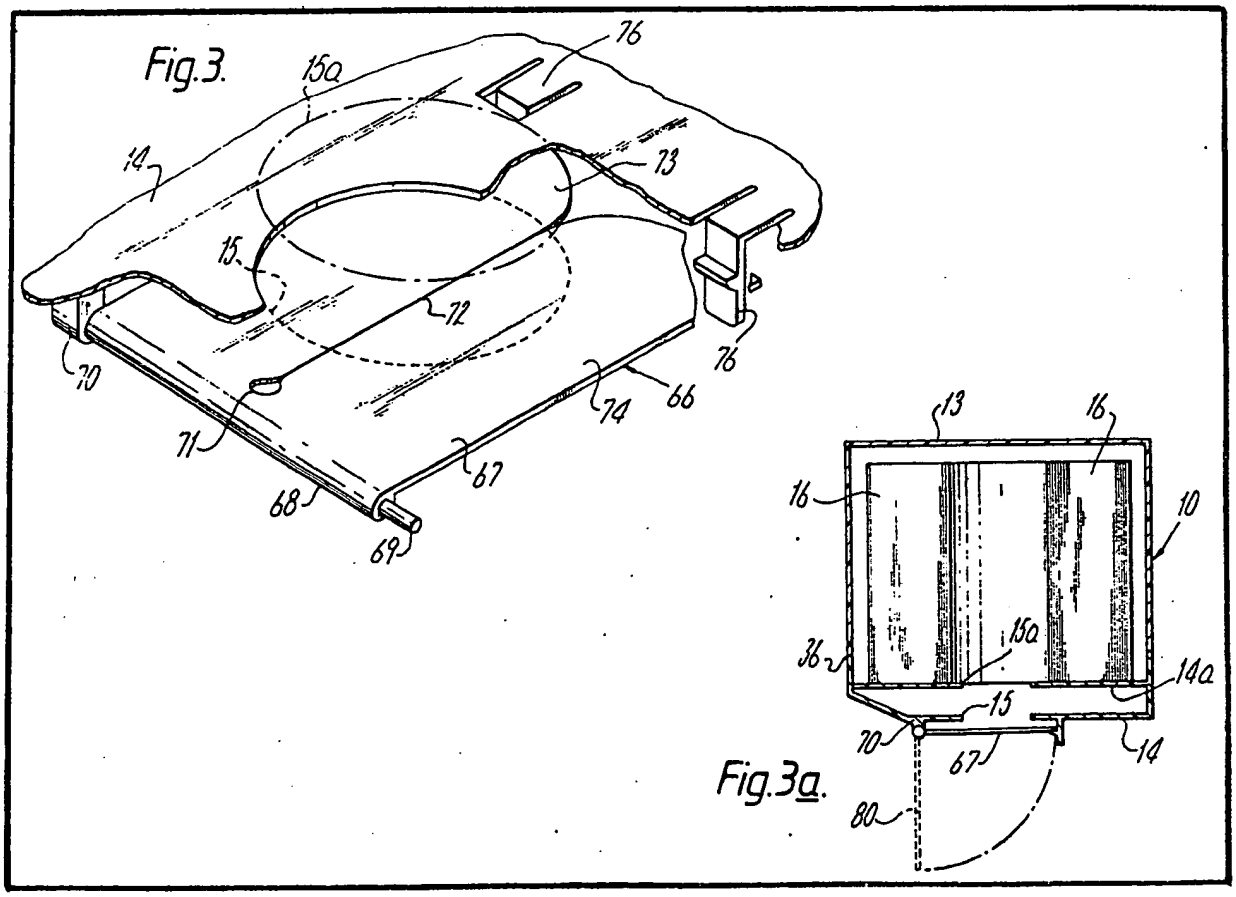
(54) Dispenser for web material

(57) A dispenser for a roll of web material perforated at intervals comprises a cylindrical housing 10 supporting a roll 16 of material in an upright position and provided with an opening 15 for the passage of web material therethrough. A friction guide 67 having friction surfaces 72 is provided beneath the opening to control the dispensing of material and is positioned either spaced from the opening 15 or movable into a position spaced from the opening such that if the web material breaks between the opening 15 and the friction guide, ready access is afforded for a user to grasp the end of the web and draw it back into the friction guide between the friction surfaces by pulling the material in a direction transverse to the roll axis.

The friction guide may be pivotally mounted 69, 70 beneath the housing. The friction guide may be in the form of a flexible element with a slit 72 therein, the slit edges trapping the material and causing it to break off at the perforations. Alternatively, the guide may comprise two juxtaposed inflexible elements (46, 48 Figure 2), at least one of which is movable, and the elements being spring biassed together to grip the material therebetween, or else the friction guide may comprise a pair of rollers spring loaded towards each other. An additional flexible diaphragm with slits may be provided between the roll and the aperture to further control the web.



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The drawings originally filed were informal and the print here reproduced is taken from a later filed formal copy.

Fig.1.

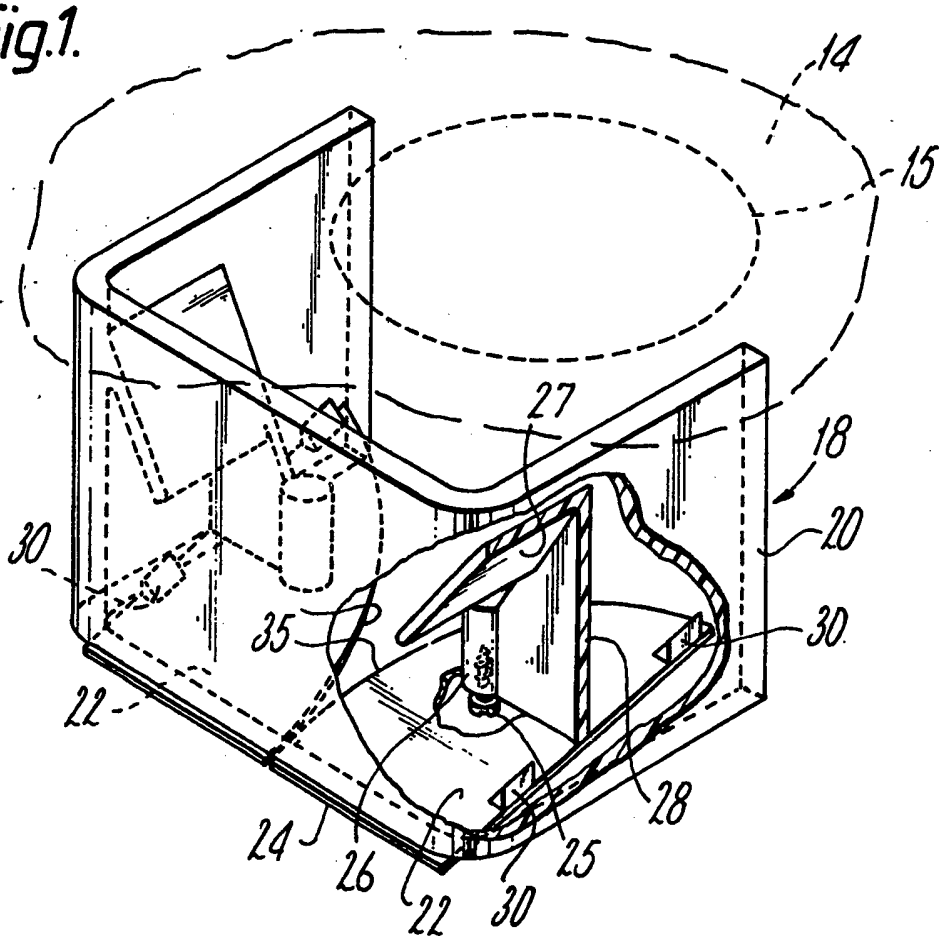

Fig.1a.

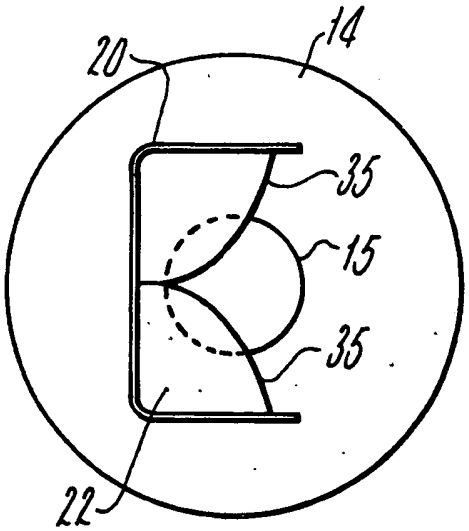

Fig.1b.

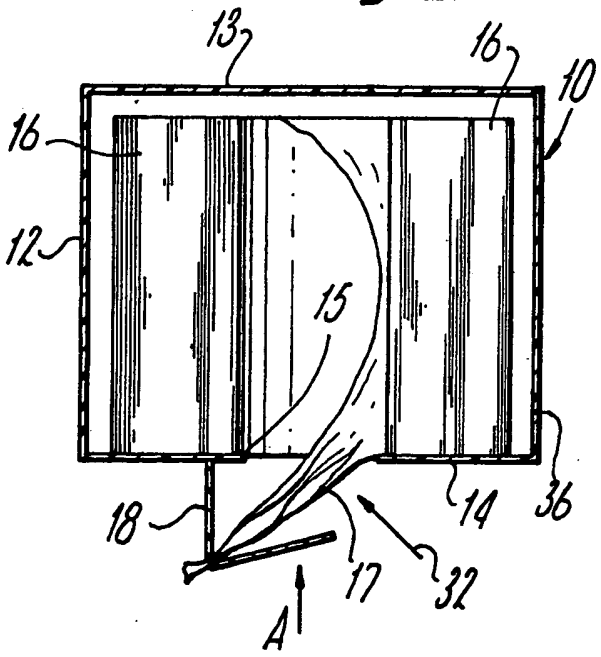

Fig.2.

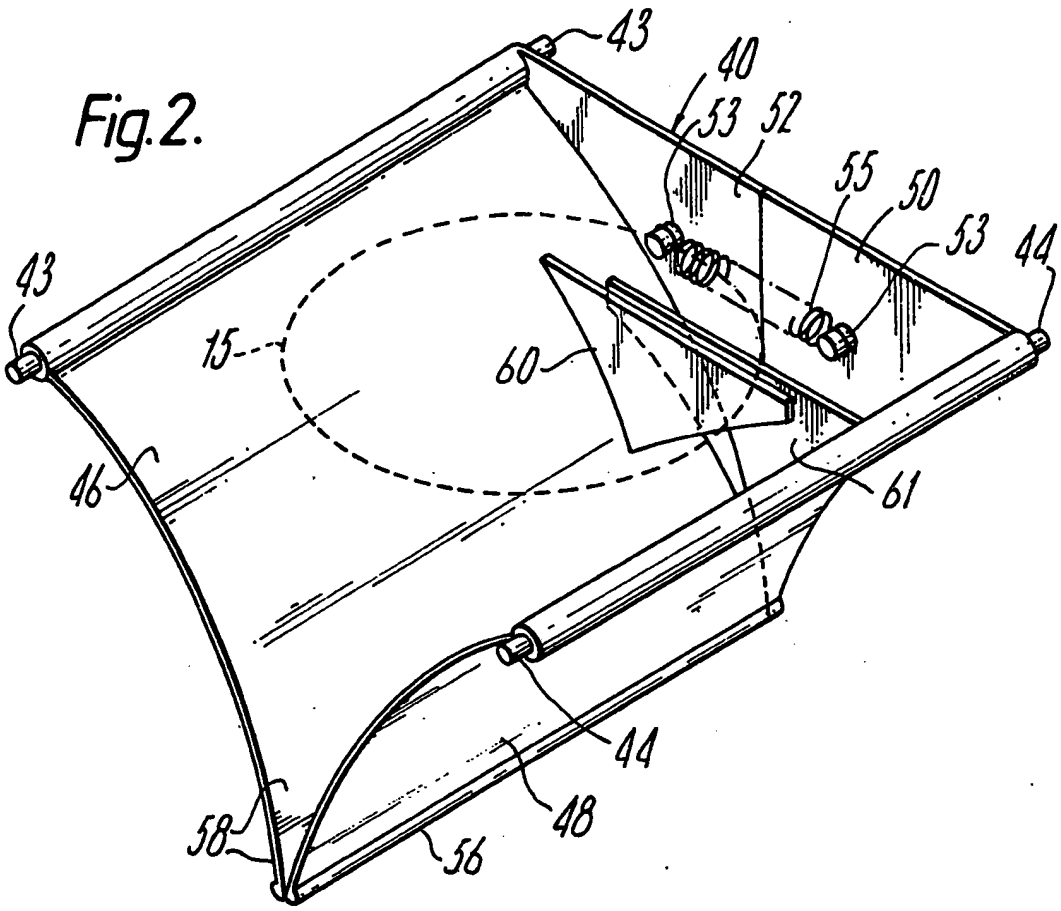
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Fig.2a.

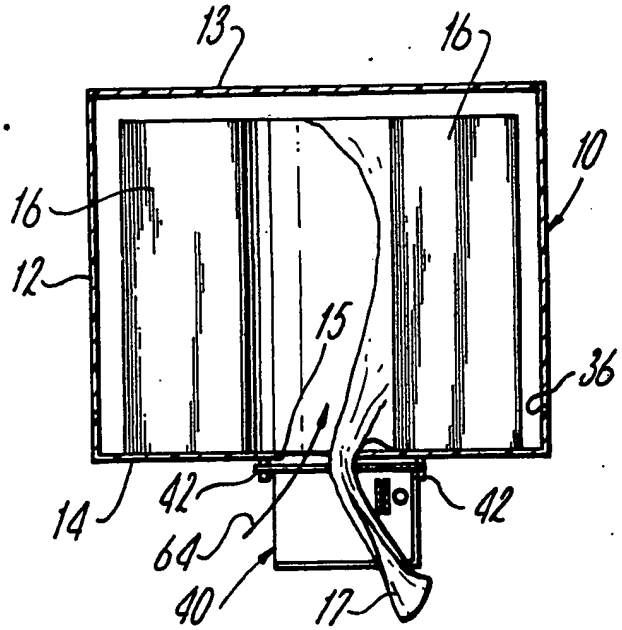
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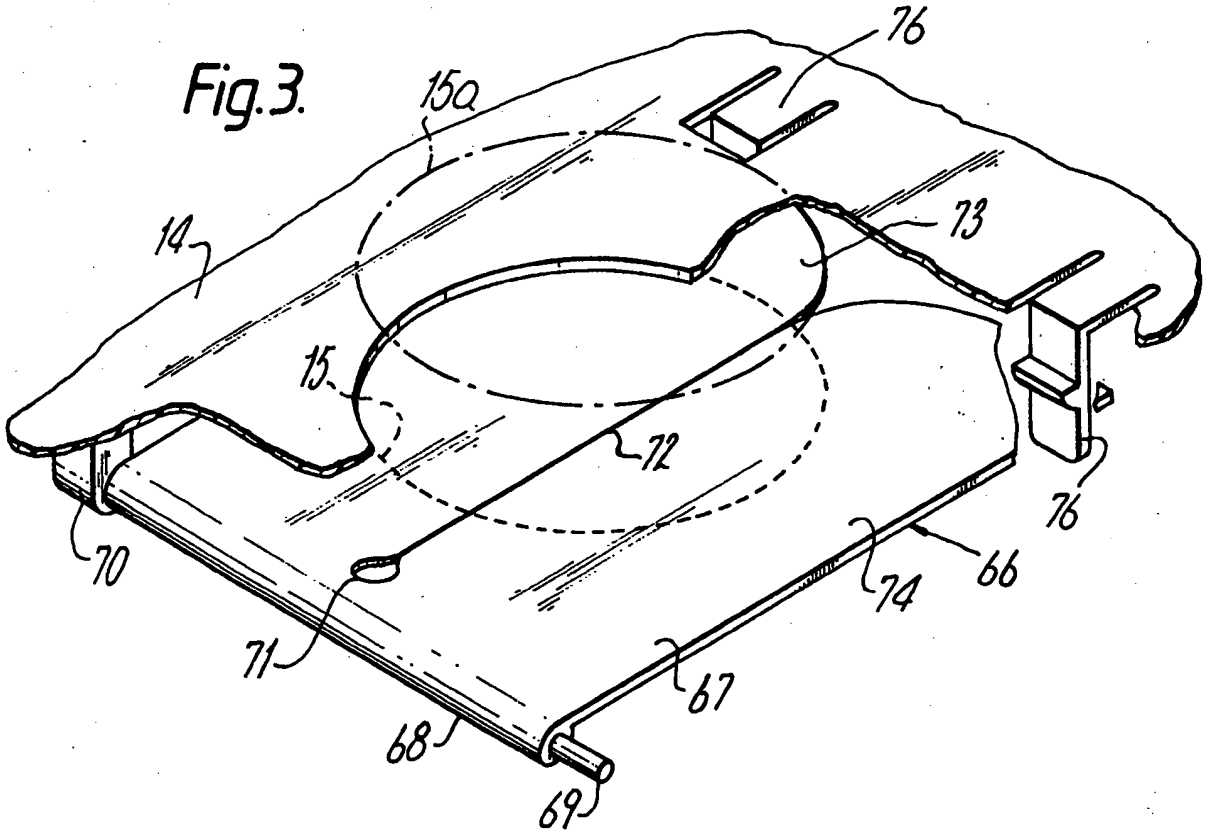
Fig.3.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15a
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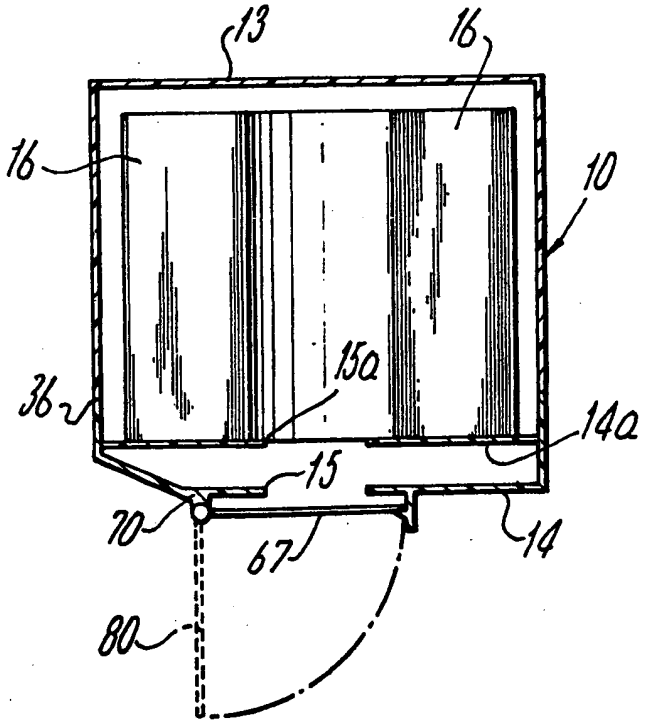
Fig.3a.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14a
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SPECIFICATION

Dispenser for paper roll

This invention relates to dispensers for paper or other web-like material rolls, and more particularly, but not exclusively, to dispensers which are intended to support a roll in an upright position, with the paper being dispensed from the inner aspect of the roll.

Dispensers of this kind, examples of which are described in U.K. Patent Nos. 1,431,829 and 1,455,216, are generally adapted for use with unperforated paper rolls, lengths of which are intended for use as hand towels. The paper is withdrawn from the dispenser through an aperture provided in the base, and tear-off assisting means, such as a row of teeth, are provided adjacent the aperture to enable each length of paper to be torn off after it has been dispensed. The aperture is usually provided in the base of the dispenser, although sometimes the aperture may instead be provided in the upper wall and the paper web withdrawn upwardly therethrough.

These dispensers are sometimes unsatisfactory, particularly with stronger paper materials, due to the difficulty involved in cleanly tearing off the paper at the tear-off assisting means, and because of this and other factors, uneven and sometimes excessive lengths of paper are removed from the roll.

To avoid these disadvantages, it has been proposed to use rolls of perforated web material in such dispensers, adjacent lengths being separated by traction on the sheet which causes the web to snap at the perforations. In order to enable sufficient tension to be applied to the sheet to cause such separation without the removal of excessive lengths, some sort of friction device is desirable, and this has been provided in the form of a flexible diaphragm disposed across the dispensing aperture, which is formed with cuts or slits through which the material is dispensed and which apply sufficient friction to the web to cause the required separation. Such friction devices are known from the smaller dispensers usually used for liquid-impregnated web materials, and examples are described in U.S. Patents Nos. 3,749,296 and 3,843,017.

The main disadvantage of this form of friction device is that should the web of material be broken inside the dispenser (rather than beneath the dispenser opening), which may occur either in use or during manufacture of the web, it is extremely difficult to push the fingers through the flexible flaps to grasp the end of the web material so as to re-start the end of the web by pulling it through the aperture. Where the dispenser is intended for public use, it is not generally desirable to provide ready access to the interior of the dispenser for this purpose, because of the problems of pilferage.

The invention provides a friction guide for a dispenser for a paper roll, which provides the required tension for a perforated roll of material, whilst allowing easy access to the interior of the dispenser to enable the end of the material to be grasped should the web separate within the dispenser.

According to the present invention, there is provided a dispenser adapted to contain and dispense a roll of web material from the inner aspect thereof, comprising support means for said roll having an aperture therein through which the material is dispensed, and a friction guide operable frictionally to engage the web of material as it is progressively withdrawn through said aperture, the friction guide being disposed relative to said aperture such that should the web separate between the friction guide and the roll, the end thereof can readily be grasped and re-introduced into the friction guide.

The ability of the friction guide to control the dispensing of the web material whilst at the same time allowing ready access to the interior of the dispenser through the aperture can be achieved in different ways. In a first arrangement, the friction guide is disposed on the dispenser so as to be movable relative to the aperture between a dispensing position in which it is adapted to control the web during dispensing, to a stand-by position away from the aperture at which access to the interior of the dispenser is possible. In this embodiment, preferably in the dispensing position the friction guide extends substantially across the aperture, whereas in the stand-by position the guide is moved away from the aperture into a position where the web of material can be fed into it from the dispenser.

In a second arrangement, the friction guide is fixed to the dispenser at a point spaced from the aperture, thereby enabling ready access to the aperture at all times.

Various embodiments of friction guide are possible according to the invention, but preferably the guide comprises a support carrying friction means adapted to grip the web of material as it passes therethrough. Suitably, these friction means comprise two or more surfaces at least one of which is resiliently-biassed relative to the other to grip web material disposed therebetween. This may be achieved by forming the friction means from an element of flexible material which has one or more slits therein through which the web material can be drawn. The edges of the slits trap the web material and any significant tension on the web causes it to snap at the perforations. In an alternative arrangement, the resiliently-biassed surfaces are formed from relatively inflexible juxtaposed elements at least one of which is movable and between which the web can pass, and spring means are provided to bias the elements towards each other to provide the necessary gripping action.

In a preferred embodiment of the invention, the friction guide is self-feeding such that when the web material is pulled through the aperture and then in a direction transverse to the axis of the roll, the web material can pass into the friction

means automatically without the user needing to guide the material thereinto. This is suitably achieved by providing an entrance opening for said resiliently-biassed surfaces directed towards the aperture in the dispenser; the entrance opening may be formed with converging surfaces ready to receive the web of material.

The invention also provides a self-feeding friction guide for a dispenser for a roll of web material, comprising a support, and friction means carried by the support adapted to receive and frictionally to engage a length of said material, said friction means comprising two or more surfaces at least one of which is resiliently-biassed towards the other so as to grip web material therebetween, and guide means for said surfaces operable, as material is dispensed, to guide the web into a position in which it is gripped between said surfaces.

In order that the invention may be more fully understood, embodiments in accordance therewith will now be described by way of example with reference to the accompanying drawings, in which:

Fig. 1 is a perspective view, partly in section, of a friction guide for use with a dispenser for paper roll material;

Fig. 1*a* is an underneath plan view of the friction guide shown in Fig. 1 fitted to the lower wall of a dispenser;

Fig. 1*b* is a sectional view through a dispenser fitted with the friction guide shown in Figs. 1 and 1*a*;

Fig. 2 illustrates a perspective view, partly in section, of another embodiment of friction guide for use with a dispenser for rolled paper material; and

Fig. 2*a* is a sectional view through a dispenser fitted with the friction guide shown in Fig. 2;

Fig. 3 is a perspective view of another embodiment of friction guide for a dispenser for paper roll material; and

Fig. 3*a* is a section through a dispenser fitted with the friction guide shown in Fig. 3.

Referring to the drawings, and in particular to Figs. 1, 1*a* and 1*b*, these show a dispenser 10 which comprises a cylindrical casing having a side wall 12, an upper wall 13, and a lower wall 14. The lower wall 14 forms a support for a roll 16 of web material contained within the dispenser 10, and the lower wall 14 is provided with an aperture 15 which is coaxial with the roll 16 through which the web 17 of material is dispensed. As will be seen from Fig. 1*b*, the web 17 is dispensed from the inner aspect of the roll downwardly through the aperture 15; for this purpose the roll 16 is coreless, and the web is additionally perforated transversely at intervals to allow easy separation into individual lengths, which in this case are intended for use as hand towels.

In order to assist in the separation of the web into individual lengths, a friction guide 18 is mounted on the lower surface of wall 14 adjacent aperture 15. The friction guide is illustrated in detail in Fig. 1, and comprises a generally U-shaped support 20 which carries friction means in the form of a pair of resilient plates 22 which are adapted to grip the web between the upper sides of the plates and the lower edge 24 of U-shaped support 20. The plates 22 are formed from any suitable flexible plastics material such as PVC or polyethylene, and are each fixed in the support 20 by a screw 25 which is engaged in a post 26 moulded into flanges 27, 28 forming part of support 20. In addition, lugs 30, also moulded integrally with support 20, provide abutments for the flexible plates 22. The support 20 is suitably moulded from a hard plastics material such as polystyrene, and acrylic.

As will be seen from Fig. 1*b*, the web of material 17 is dispensed through the aperture and, under normal dispensing conditions, passes into the friction guide 18 where it is trapped between flexible plates 22 and edge 24 of support 20. The upward pressure of the plates 22 against the web causes sufficient friction to ensure that the web snaps at the perforations when traction is applied to the web beyond the guide. Should however the web 17 break between the guide and the roll 16, the U-shaped nature of the support 20 and its position relative to the aperture 15 enables a user to insert his hand between the support and the lower wall 14, in the direction of arrow 32, so as to grasp the free end of the web 17, and thereby to re-introduce it into the guide 18. This feature is distinct from the known arrangements of dispenser friction guides, which are generally provided across the aperture 15 and which make it extremely difficult to re-start the material web if it snaps within the dispenser.

Because the user of the dispenser may not feel obliged to re-start the material through the friction guide, it is a most desirable feature that the friction guide should be self-feeding, i.e. able to re-introduce the material automatically without the necessity of the user having to take any specific action to insert the end of the web. Such a feature is inherent in the friction guide shown in Figs. 1, 1*a* and 1*b* and is provided by a combination of the disposition of the guide 18 below the dispensing aperture 15, and the provision of an entrance into the friction guide in the form of converging edges 35 provided on the flexible plates 22. These converging edges are most easily seen from Fig. 1*a*, and operate to gather the web of material 17 and feed it into the gap between the lower edge 24 of the support 20 and the plates 22. Thus, when a length of material 17 is pulled through the aperture 15 downwardly and then side ways towards the user, as would be the case in a normal dispensing action, the converging edges 35, and the inclined nature of the plate 22 relative to support 20 combine to trap the material and feed it into the guide 18 without the necessity of the user having to take any specific action to restart the material in the guide.

The friction applied to the web by plates 22 can be made adjustable by various methods, such as the use of interchangeable friction plates of different degrees of resilience, or by adjusting the position of the plates relative to their support. This enables the dispenser to accommodate different thicknesses or types of material.

When the roll of material 16 is exhausted, the top part of the dispenser 10 can be separated from the base part along a line 36 to enable replenishment of the roll.

Figs. 2 and 2*a* illustrate a different embodiment of friction guide to that shown in Fig 1. In this embodiment, the dispenser 10 is substantially identical to that shown in Fig. 1*b*, with the exception of the fixing means for the friction guide, which in Figs. 2 and 2*a* is designated by Figure 40. These fixing means comrise lugs 42 which pivotally receive spigots 43, 44 provided respectively at the upper edges of diverging plates 46, 48 which together comprise the friction means. These plates 46, 48 are formed from a relatively rigid plastics material and are pivotally mounted beneath the lower wall 15 by means of lugs 43, 44. Each plate is provided with a front wall 50, 52 respectively each of which incorporates a projection 53 forming a connecting point for a coil spring 55. The coil spring 55 biasses the two plates 46, 48 towards each other so that they are capable of gripping the web 15 between their lower edges 56, 58 respectively. These lower edges are rounded to prevent damage to the web as it is pulled between the plates, as shown in Fig. 2*a*. The tension necessary to pull the web between the plates can be adjusted by adjusting the strength of the spring 55.

In order to prevent the web 17 from being pulled forwardly out from between the lower edges 56, 58, and jamming in the guide, overlapping guide plates 60, 62 are provided respectively on the plates 46, 48. As will be seen from Fig. 2*a*, these control the web of material as it is drawn from the aperture 15.

As with the embodiment shown in the previous Figures, should the web 17 snap upstream of the guide 40, a hand can be inserted into the aperture 15 in the direction of arrow 64 to grasp the end of the web so that it can be re-introduced into the guide 40. Again, the guide 40 is self-feeding, in that once the end of the web 17 has been grasped by a user, a normal dispensing action will cause the end of the material to follow the rear edges of plates 46 and 48 and pass into the guide 40 where it will be gripped by the two converging plates.

A third embodiment of friction guide is shown in Figs. 3 and 3*a*. In this case, the dispenser 10, although similar to those shown in the preceding embodiments, is different in that the roll 16 is supported on an intermediate support 14*a* which is provided with an aperture 15*a* coaxial with the aperture 15 in lower wall 14. The purpose of intermediate wall 14*a* will be described hereinafter.

In this embodiment, the friction guide 66 is movably mounted on the dispenser 10, and comprises a support 68 which is integral with the friction means. The support 68 comprises a substantial flat control plate 67 and is provided with pivot pins 69 which are received in lugs 70 fixed to the lower wall 14. The support 68 may be moulded from a relatively resilient plastics material, and the control plate 67 is formed with a slit 72 which divides the plate centrally into two adjoining flaps 73, 74 of resilient material. The slit 72 terminates in a circular aperture 71, and at the other end of the slit, the plates 73, 74 diverge to form an entrance into which the web material can readily pass.

The support 68 is movable between a dispensing position shown in Fig. 3, in which it is retained by means of catches 76 moulded integrally into the lower wall 14, to a stand-by position shown in broken lines in Fig. 3*a* at which web material may be fed back into the friction guide.

During normal dispensing, the web of material runs through aperture 71, the edges of which exert sufficient friction to cause the material to snap at the perforations after it has been pulled through the friction guide. Should the web of material snap upstream of the friction guide 66, the catches 76 can be released and the support 68 will drop to its stand-by position shown at 80 in Fig. 3*a*, which allows access to the interior of the dispenser through apertures 15 and 15*a*. The curved end surfaces of the flaps 73, 74 ensure that the material is automatically fed back into aperture 71 via slit 72 when the material is pulled downwardly and sideways through the guide. The guide 66 may then be pushed back into its closed position shown in Fig. 3*a* to allow normal dispensing to continue. If desired, a spring (not shown) may be provided to ensure that the support 68 automatically re-closes after the web material has been fed into aperture 71.

In this embodiment, the friction applied by the guide is made variable by the use of interchangeable control plates 67 moulded from various thickness or grades of material and/or with different widths of slit.

Because the control plate 67, in the dispensing position of support 68 substantially covers aperture 15, it is necessary to support the roll 16 at a point spaced from the aperture to avoid the web from becoming tangled inside the dispenser, and the intermediate support 14*a* with its aperture 15*a* is provided for this purpose.

In addition to the friction guides shown in the drawings attached hereto, additional control of the web may be achieved by providing a flexible diaphragm between the roll 16 and the aperture 15. This diaphragm, which is provided with slits (generally in a cruciform formation) assists in the dispensing of the web of material prior to it passing into the friction guide.

Various alternative arrangements of the dispenser and the friction guides are possible within the scope of this invention. For example, in

another embodiment, not illustrated, the friction guide comprises a pair of rollers between which the web of material is extracted. The rollers are spring-loaded towards each other to provide the necessary friction on the web. One advantage with this arrangement is that it is relatively simple to adjust the tension on the web applied by the rollers to suit different types of material.

It is not essential that the friction guides shown are used with a dispenser adapted to dispense from the inner aspect of a roll; instead they may be used with any form of dispenser for a continuous web in a roll form.

Claims (Filed on 26 Apr '83)

1. A dispenser adapted to dispense a roll of web material from the inner aspect thereof, comprising roll support means for said roll having an aperture therein through which the web material is dispensed, and a friction guide for the controlled dispensing of said web material comprising friction surfaces operable frictionally to engage the web material as it is progressively withdrawn through said aperture, the friction guide being adapted such that should the web material separate between the guide and the roll, the end thereof can readily be grasped and then re-introduced into the friction guide between the friction surfaces by pulling the web material towards the guide in a direction generally transverse to the axis of the roll.

2. A dispenser as claimed in Claim 1, wherein said friction surfaces are resilient friction surfaces comprising the edges of an opening formed in a resilient material element.

3. A dispenser as claimed in Claim 1, wherein the friction surfaces comprise substantially inflexible juxtaposed elements between which the web material can pass, at least one of said elements being mounted for movement towards the other, and spring means operable to bias said at least one element towards the other so as to grip the web material therebetween.

4. A friction guide as claimed in any of Claims 1 to 3, wherein said resilient friction surfaces are configured to guide the web material into the friction guide when the web material is pulled through the aperture and towards the guide in a direction generally transverse to the axis of the roll.

5. A dispenser according to any of Claims 1 to 4, wherein the friction guide is movably disposed relative to said support means, and is movable from a dispensing position in which it is operable to control dispensing of web material as it passes between the friction surfaces, to a stand-by position in which position an end of the web material located between the roll and the guide can be grasped and re-introduced into said guide.

6. A dispenser as claimed in Claim 5, wherein the friction guide is pivotally mounted relative to said support for movement between the dispensing and stand-by positions, and latch means are provided operable to retain the friction guide in the dispensing position.

7. A dispenser as claimed in Claim 5 or Claim 6, comprising a generally cylindrical housing having an end wall with an opening therein for said web material, and said friction guide is pivotally mounted on said end wall and comprises a generally planar element of flexible plastics material which in the dispensing position of said guide is disposed across said opening; said element being formed with a slit therein through which said web material can pass, and the edges of said slit being adapted frictionally to engage the web material as it is progressively withdrawn such that the web material is caused to separate beyond said guide when sufficient traction is exerted on the web material; and whereby one end of said slit is open and forms a diverging entrance thereto such that when the friction guide is in the stand-by position and the web material is pulled towards the guide in a direction generally transverse to the axis of the roll, the web material is guided into the slit by the diverging entrance thereof.

8. A dispenser as claimed in any of Claims 1 to 3, wherein the friction guide is fixed relative to said support means, and is disposed in a position spaced therefrom to allow ready access to the end of the web material should this separate between the guide and the roll.

9. A dispenser as claimed in any of Claims 1 to 3, comprising a generally cylindrical housing having an end wall with an opening therein for passage therethrough of said web material, and wherein said friction guide comprises two juxtaposed guide elements each having an edge which defines said friction surface and wherein the elements converge to form a nip into which the web material may be drawn so as to be acted upon by the friction surface.

10. A dispenser as claimed in Claim 9, wherein the guide elements are mounted on the housing below the opening in the end wall in a manner such that ready access is afforded to the zone between the two guide elements where opposing parts of the guide elements are relatively widely spaced whereby, if the web of material should break at a point between the opening in the end wall and the friction guide, the end of the web can then be grasped in that zone and pulled in a direction generally transverse to the axis of the roll to be reintroduced into the nip between the two guide elements.

11. A dispenser as claimed in any of Claims 1 to 10, containing a roll of web material formed with transverse perforations at intervals therealong.

12. A dispenser adapted to dispense a roll of web material from the inner aspect thereof, substantially as hereinbefore described with reference to Figures 1, 1*a*, and 1*b* or Figures 2 and 2*a*, or Figures 3 and 3*a* of the accompanying drawings.

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